Flow-Throughs and Tiering
Using Schedule K-1 Data To Study Tax Compliance

Julie Buckel, SB/SE Research, Seattle/San Jose
Presented at the 2003 IRS Research Conference, June 2003

A flow-through is a business entity that may generate or receive taxable income, but which pays no income tax in its own right. Its gains and losses are allocated, or "flow through," to those with ownership interests. These parties then report the gains and losses on their own tax returns. The resulting avoidance of "double taxation" makes partnerships, trusts, and Subchapter S corporations attractive to entrepreneurs and financial planners. In recent years, such entities are becoming increasingly popular as modes of business organization and instruments of financial planning, with tax return filings increasing rapidly.

Flow-throughs are also a growing tax compliance concern.   One particular flow-through compliance concern is the existence of complex structures of related entities. Many flow-through entities are allowed to allocate income to other flow-throughs. When they do, the result is a structure with multiple layers of flow-throughs, a situation referred to as tiering.

For a complex structure, answering basic tax compliance questions (What amount and type of income was earned? Who is responsible for reporting it? Was it in fact reported?) becomes more difficult. This provides an unfortunate incentive for taxpayers to create complex tiering structures in order to disguise non-compliance.   Thus, when deciding how to address the compliance problems presented by tiering, it is also important to ask how such structures arise. Are they inadvertent, deliberate, or the work of tax promoters? Are they new or old? If a complex structure consists of new and/or short-lived entities, it seems more likely that the complexity was contrived rather than inadvertent. Different kinds of compliance treatments may be called for, depending on how these questions are answered.

Until recently, the tax compliance problems presented by flow-through tiering were made more difficult by the fact that the documents used to trace income allocation from flow-throughs were not part of IRS electronic data bases. Partly in response to IRS concerns, Congress authorized the resumed transcription of data from Schedules K-1 (the reporting instrument used by flow-throughs), starting with Tax Year 2000. With the advent of K-1 transcription, the IRS now has the opportunity to use powerful data analysis methods to study the nature and extent of tiering, and to devise new methods for identifying and addressing the associated compliance issues.

Many data analysis approaches can be used to study tiering. Different choices of the unit of analysis can be made: the K-1 records themselves, the unique payors, the unique payees, or the set of all involved entities (where payor and payee roles are variables of analysis). Here, we discuss one summary measure

relating to tiering, which we call depth of tiering. The depth-of-tiering concept exploits the fact that any complex structure has a core set of flow-through entities, and the most deeply embedded ones are both payors and receivers of flow-through income. After first defining some preliminary terms, we use the depth-of-tiering notion to define tiering layers and uniquely assign each payor entity to a layer. We then present some summary results stratified by those layers. Finally, we draw some conclusions about the usefulness of depth of tiering as a summary measure.

Background
This section provides background on flow-through business entities, Schedule K-1 reporting documents. It then introduces mathematical graph theory terms and explains how they are used in the tiering structure setting.

The three types of payors of flow-through income are partnerships (which file Form 1065), trusts (which file Form 1041[1]), and Subchapter S Corporations, often simply called S corporations (which file Form 1120S). The parties who receive flow-through income are called, respectively for the three kinds of flow-throughs, partners, beneficiaries, and shareholders. Here, we use the generic terms member or recipient for all three types of payees. The Forms 1065, 1041, and 1120S that the payors file are called "parent returns."

When a flow-through parent return is filed, it includes document s reporting the income allocations to each recipient. These reporting documents are Schedules K-1. There are many kinds of income reported on Schedule K-1. Some are always in the form of gains, but others can be gains or losses. The types of flow-through income, losses, and expenses reported on Schedules K-1[2] are:

Gains only
- Interest,
- Dividends
- Royalties

Gains or losses
- Ordinary income
- Business income
- Rental real estate income
- Other rental activity income
- Passive income
- Short-term capital gain/loss
- Long-term capital gain/loss

---

[1] Not all trusts are required to file Form 1041 and use Schedule K-1. In addition, portions of a trust's income can be taxed at the trust level, rather than flowing through to a recipient.
[2] Two other items which are not flow-through allocations, but which are needed by the recipients to prepare their own tax returns, are guaranteed payments to partners, and withheld taxes.

Expense only
- Section 179 expense

Mathematical graph theory provides a useful framework and set of terms for describing tiering structures. A graph contains nodes (or vertices) and links (or edges), where links connect pairs of nodes. In a directed graph, the links are not symmetric, and are instead thought of as having a starting and an ending node.

In the tiering structure setting, the taxpayer entities embedded in the structure are the nodes, each of which has a unique Taxpayer Identification Number (TIN). A directed link exists from one TIN to another if there are one or more Schedules K-1 with the first TIN as payor and the second TIN as payee.

Depth of Tiering
As stated earlier, understanding the tax compliance of tiering structures can be difficult. One way to study a complex structure is to ignore temporarily all links to non-flow-through recipients and concentrate instead on links with a flow-through payee. One such approach to studying the cores of tiering structures is the notion of depth of tiering.

A tiering structure is very deep if it contains long chains of flow-through entities connected by payor-payee linkages. A chain consists of a series of links, where the payee of the first link becomes the payor of the next link, and so on. Each chain thus has a top end and a bottom end. It is possible to view any structure of directed links between nodes as a collection of strait chains. This is true no matter how branched it might be, provided the chains are allowed to be partially redundant. A particular entity is deeply embedded in the structure if it is in the middle of some long chain.

The difficulty of studying the flows of income through a deep tiering structure increases by orders of magnitude as the depth increases. At any point in a given chain, a flow-through entity may generate new income through business operations, or it may receive income allocations from other flow-throughs (which is to say it may be part of other chains). Any of the entities in the chain may allocate its income to a combination of taxable and flow-through entities. Thus, as income starts at the top of a chain of flow-throughs and works its way downward, additional income and losses can enter the chain, leave it, or be newly generated within it.

The ways income enters, leaves, or is generated within, a chain all have tax compliance implications. Clearly, rather than immediately trying to devise ways to summarize entire chains and their larger structures, some smaller scale piecemeal approach is needed. Depth of tiering, as a characteristic of individual flow-throughs, is one such approach.

Describing the K-1 population

Payees are categorized as follows:

- individuals   payee has an SSN (or ITIN)
- flow-throughs   payee has an EIN and also issues K-1's
- other businesses   payee has an EIN but is not a K-1 issuer

SSN = Social Security number
ITIN = individual taxpayer identification number (replacement for SSN)
EIN = employer identification number

Note that, for all the following analyses, we first set aside all Schedule K-1 records with invalid Taxpayer Identification Numbers (TIN's). Of course, invalid TIN's are always of great concern to tax compliance, but we cannot assess their role in the cores of tiering structures using methods that rely on uniquely identifying each entity.

There are numerous instances of redundant pairs of payor and payee TIN's in the original K-1 data base. This too has implications for tax compliance, which we ignored for this analysis. The following table summarizes the unique pairings of valid payor and payee TIN's that exist in the K-1 data base.

Table 1. Unique combinations of K-1 payor-payee
Tax Year 2000 Schedule K-1 data
(rounded to thousands)

	Individual	**Bus. Non-FT**	**Flow-Th.**	**Total (app)**
Partnership	8,300	804	602	9,700
Trust	2,000	254	794	3,050
S-corp	3,910	44	19	3,980
Mixed	30	1	0	32
Total (app)	14,600	1,100	1,420	16,800

Tiering Layers
The K-1 data base for Tax Year 2000 is known to be incomplete. Certainly, there exist flow-through entities that do not appear as payors in the Tax Year 2000 K-1 data base. But, for the purposes of this analysis, we do not distinguish between such entities and other non-individual entities. In order to define tiering layers, some preliminary working definitions are needed.

A flow-through is any issuer of K-1's with valid TIN's in our K-1 data base. An SSN K-1 is a K-1 issued to a TIN other than an EIN. An end EIN K-1 is a K-1 issued to an EIN that does not itself issue K-1's. A tiering EIN K-1 is a K-1 issued to an EIN that does issue K-1's.

Using these definitions, it was found that:
- 20 percent of payors issue at least one end EIN or tiering EIN K-1.

- 9.4 percent of payors issue only tiering K-1's.

Based on the kinds of K-1's they issue and receive, we can now define three layers of flow-through entities. Top-layer entities issue tiering EIN K-1's but never receive any. Bottom-layer entities issue only SSN K-1's and End EIN K-1's. Middle-layer entities both issue and receive tiering K-1's.

Note that entities in the top and middle layers may or may not issue SSN K-1's or End EIN K-1's. All flow-throughs that never receive or issue tiering K-1's are by definition part of the bottom layer.

Layer composition - entities
After stratifying the unique K-1 payors into the three layers, we looked at the layer distribution of each of the three types of flow-through payors.

Table 2. Unique Flow-Through Payors
Tax Year 2000 K-1 Data
Percent of each type in layers

layer	Partnership	Trust	S corp	All FT
Top	15.0%	38.2%	0.2%	15.4%
Middle	2.7%	0.1%	0.0%	0.9%
Bottom	82.3%	61.8%	99.8%	83.7%

Virtually all of the Sub-chapter S corporations are in the bottom layer. This is because, under normal circumstances, an S corporation is required to have only U.S. individuals as shareholders. The middle layer is very small, containing less than 1 percent of all flow-throughs, and partnerships account for more than their share of it. Trusts are over-represented in the top layer, which contains 15 percent of all flow-throughs, but over 38 percent of trusts.

There is currently some question about whether all of these top layer trusts are even of the kinds that are required to issue Schedule K-1's. Hence. the trust over-representation in the top layer might not occur if we were able to refine the working definition of a flow-through to exclude those without K-1 filing requirements.

Some further stratification of the bottom layer is possible. As noted earlier, the bottom layer includes all non-tiered flow-throughs. Some of these issue K-1's only to individuals, others to both businesses and individuals. These sub-layers are summarized in the first two rows of Table 3. Other sub-layers consist of those that are connected upward to other layers, some only to top-layer flow-thoughs, and others to at least one middle-layer flow-through. These sub-layers are summarized in the last two rows of Table 3.

Table 3. Unique Flow-Through Payors
Tax Year 2000 K-1 Data

Percent of each type in bottom sub-layers

Sub-layer	Partnership	Trust	S-corp	All-FT
Individual	68.8%	52.5%	94.5%	75.1%
Bus/Ind	8.0%	2.5%	0.8%	3.4%
To top only	4.2%	4.8%	3.4%	4.0%
To middle	1.3%	2.0%	0.7%	1.2%

The majority of the bottom layer issues K-1's only to individuals, or to a combination of individuals and non-flow-through businesses.

It is also possible to divide the top layer into sub-layers. Top layer flow-throughs that only connect directly to bottom-layer entities may be separated from those that connect to at least one middle-layer flow-through.

Table 4. Unique Flow-Through Payors
Tax Year 2000 K-1 Data
Percent of each type in top sub-layers

Sub-layer	Partnership	Trust	S-corp	All-FT
To bot. only	11.2%	19.1%	0.2%	8.8%
To middle	3.8%	19.1%	0.0%	6.6%

The large majority of the top layer partnerships connect only to bottom layer flow-throughs and are, thus,only in short chains of two entities. The top-layer trusts are evenly divided between those who connect to middle-layer entities and those that are only in two entity chains.

Payor-payee linkages
It is also of interest to analyze the linkages themselves and see how many distinct payor linkages (i.e., how many unique payor-payee combinations) originate in a given layer.

Table 5. Unique Payor-Payee Combinations
Tax Year 2000 K-1 Data
Percent of Unique Pairs in Layers, Within Payor Type

payor layer	Partnership	Trust	S-corp	All FT
Top	33.6%	43.8%	1.5%	27.8%
Middle	17.7%	0.3%	0.3%	10.6%
Bottom	48.7%	65.9%	98.2%	61.6%

As expected, the middle and top layers originate more than their share of payment linkages, based solely on how many payors are involved. But the share is only noticeably larger for partnerships.

Recursive partitioning

The middle set of entities can be recursively partitioned. The middle set of flow-throughs can be used as a new frame of reference to determine (with respect to the current group) who is only a payor, who is only a payee, and who is both. Once a new middle set is obtained, it can serve as the new frame for the next iteration. How long a given entity stays in the series of middle layers defined by this process says something about how deeply tiered it is at its worst. General results of this recursive partitioning are:

- Recursion stops in 7 iterations (attenuates rapidly after 3)
- After the first iteration, most S corps are gone
- After the second, most trusts are gone
- Partnerships account for most of the inner layers

Thus, it is reasonable to conclude that entities are typically not embedded very deeply in tiering structures, but that the most deeply embedded are partnerships.

An as yet unanswered question is whether the inner layer connections that force an entity into a deep layer are really the important ones. Finding out might entail looking at how much money is involved, perhaps as a percent of total amounts flowing into and out of the entity. Alternatively, it could be important to distinguish entities with many connections to other flow-throughs from those with only a few.

A third consideration is how many K-1 connections to non-flow-throughs exist. If there are about as many taxable payees for a middle layer payor as there typically are for outer layer payors, it looks more like the tiering is accidental than deliberate.

Limitations – Future work
In general, there is a great need for better defined business rules to distinguish between important and unimportant K-1 links between payors and payees. Without them, too many meaningless K-1connections lead to placing into a common structure entities that should not be viewed in any sense as part of the same "economic entity."

Attempts were made during the project to give working definitions to such concepts as proportionate and disproportionate distributions, since this general principle is involved in many flow-through tax compliance issues. Another concept requiring definition is the notion of attenuation of income.

Currently, the data base contains records for entities that issue hundreds or even thousands of K-1's. Secondary mortgage investment firms and other large-scale financial services providers operate as flow-throughs. These entities can have both many investors and many investments in other flow-throughs and can hence cause many entities to be drawn into their tiering structures. Most of the connections of such entities are not pertinent to studying tiering in the rest of the

population of flow-throughs.

Depth of tiering, as a means for quantifying an entity's involvement in tiering, will only be as powerful as the business rules feed into it. It is these business rules that will make it possible to draw boundaries around the nodes of a tiering structure graph and say with some degree of confidence that the taxpayers thus captured should be viewed for tax compliance purposes as a single complex economic unit.